

GUKOVA, V.D.

Some types and mineral facies of greisens in central Kazakhstan.
Trudy Inst.geol.nauk AN Kazakh.SSR 6:116-145 '62.

(MIRA 16:6)

(Kazakhstan--Greisen)

SHCHERBA, Grigoriy Nikiforovich, prof., doktor geol.-mineral. nauk,
zasluzhennyy deyatel' nauki KazSSR; GUKOVA, Vera Dmitriyevna;
KUDRYASHOV, Arkadiy Vasil'yevich; SENCHILO, Nikolay
Panteleyevich; NESTEROVA, I.I., red.

[Greisens, vein quartz, and potassic feldspar in molybdenum-
tungsten deposits of Kazakhstan.] Greizeny, zhil'nyi kvarts i
kalishpaty molibdeno-vol'framovykh mestorozhdenii Kazakhstana.
Alma-Ata, 1964. 306 p. (Akademiya nauk Kazakhskoi SSR. Institut
geologicheskikh nauk. Trudy, vol.8) (MIRA 17:6)

L 16976-63
Pz-4 JD/AT

EWI(1)/EWG(k)/ENP(q)/EMI(m)/RDS AFFTC/ASD/ESD-3/IJP(0)
S/020/63/149/006/023/027 70

AUTHOR: Ugay, Ya. A., Averbakh, Ye. M., Gukova, Yu. Ya., and Lavrov, V. V.

TITLE: A new semiconductor ²⁷ phase in zinc-antimony ²⁷ system

PERIODICAL: Akademiya nauk SSSR. Doklady. v. 149, no. 6, 1963, 1387-1389

TEXT: The authors investigated the intermetallic compound Zn_4Sb_3 in the Zn-Sb system, suspecting this compound to be a semiconductor. To prove this, they chose the beta-modification of Zn_4Sb_3 , stably existing between -10 and 485°C. They isolated for the first time monocrystals of this compound by three different techniques and found it to be a gray substance with a metallic luster, fairly brittle, with a slightly vitreous, conchoidal fracture. Microhardness approximately 200 kg/mm². The pycnometric specific weight of large crystals is 6.81. The possibility of cleaning this compound by zone recrystallization was demonstrated. The physicochemical and electrical properties of Zn_4Sb_3 also are described here for the first time. There are 3 figures and 1 table.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet (Voronezh State University)

SUBMITTED: August 3, 1962

Card 1/1

USSR

✓ Occurrence of berthierite in deposits of B. Trans-Baikal.
Z. V. Gukova. *Zapiski Vsesoyuz. Mineralog. Obshchestva*
45, 234 (1964). Complex veins with pyrite, arsenopyrite,
hemimorphite, boulangerite, and pyrrhotite, which intersect
dolomitized limestones and skarns, show locally berthierite
crystals 2-3 cm. long. In polished sections the mineral is
intimately intergrown as tiny needles in vein quartz. The
spectral analysis did not show any Pb in the berthierite.
The optical anisotropy is very strong. The paragenesis is
that of a typical low-temp. hydrothermal system. In this
respect the occurrence is analogous to that of berthierite in
Au veins of Kuludzhinsk (Kalinin Range), associated with
stibnite, and of Razdol'ninsk in the Enisei Region.

W. F. Felt

GUKOVICH, N.P.; MARKOV, A.I.

They write to us. Transp. stroi. 12 no.11:62 N '62. (MIRA 15:12)

1. Rukovoditel' brigady Kiyevgiprotransa (for Gukovich). 2. Nachal'nik
otdela tekhnicheskogo kontrolya Podstepnyanskogo (for Markov).
(Railroad engineering)

GUKOVICH, V.A., kand.med.nauk

Histopathological changes in the stapes in obliterating otosclerosis and their clinical importance. Zhur.ush., nos. 1 gorl. bol. 24 no.5: 37-45 S-0 '64. (MIRA 18:3)

1. Iz Nauchno-issledovatel'skogo instituta otolaringologii Ministerstva zdravookhraneniya UkrSSR (dir. i nauchnyy rukovoditel' zasluzhennyi deyatel' nauki prof. A.I.Kolomiychenko, konsul'tant raboty - doktor med. nauk N.Ye.Botsman).

GUKOVSKAYA, Natal'ya Isidorovna, sovetnik yustitsii; SVESHNIKOV, Vyacheslav Aleksandrovich, podpolkovnik med. sluzhby; VASIL'YEV, A.M., kand. yurid.nauk, otvetstvennyy red.; DAMANINA, Ye.D., red.; KOSAREVA, Ye.N., tekhn.red.

[Medicolegal examination of the corpse in cases of violent death;
a manual for investigators] Sudebnomeditsinskaya ekspertiza trupa
po delam o nasil'stvennoi smerti; posobie dlia sledovatelei.
Moskva, Gos.isd-vo iurid.lit-ry, 1957. 254 p. (MIRA 10:12)
(AUTOPSY) (MEDICAL JURISPRUDENCE)

GUKOVSKAYA, O. A.

PA 244T40

USSR/Medicine - Typhoid

Mar 53

"The Effect of Intervals Between Inoculations on Typhoid-Paratyphoid Immunization," O. A. Gukovskaya, Inst. Epidemiol and Microbiol iment N. F. Gamaleya, Acad Med Sci USSR

"Zhur Mikrobiol, Epidemiol, i Immunobiol" No 3, pp 62-65

Lengthening the interval between the two inoculations in the immunization of experimental animals from 7 days to 20-30 days resulted in a much higher percentage of survivals after the animals had been

244T40

infected with massive doses of a live virulent culture of typhoid bacteria. A twofold immunization with a 30 day interval between inoculations is equivalent to a threefold immunization with 7 day intervals both in regard to the effectiveness of the immunity and the percentage of survivals after infection.

244T40

GUKOVSKAYA, O.A.; TSEYTLIN, A.Ya.

Sensitivity of serotypes of pathogenic *Escherichia coli* to
antibiotics. Antibiotiki 7 no.12:1098-1100 D' 62 (MIRA 16:5)

1. Bakteriologicheskoye otdeleniye laboratorii (zav. V.B.Kleyner)
sanitarno-epidemiologicheskoy stantsii Zhdanovskogo rayona Moskvyy.
(*ESCHERICHIA COLI*) (ANTIBIOTICS)

ALEKSANDROW, Pavel Sergeyevich; NEMYTSKIY, Viktor Vladimirevich; VOVCHENKO, G.D., professor, redaktor; GUKOVSKAYA, V.A., redaktor; KOVNATOR, R.A., redaktor; MULIN, Ye.V., tekhnicheskiy redaktor.

Vlacheslay Vasil'evich Stepanov. Moskva, Izdatel'stvo Moskovskogo universiteta, 1956. 58 p. (MLA 9:5)
(Stepanov, Vlacheslay Vasil'evich, 1889-1950)

L 19453-65 ENT(d)/ENP(1) Po-l/Pq-l/Fg-l/Pk-l/Pl-l IJP(c)/AEDC(a)/SSD/ASD(a)-5/
 ASD(s)/AFMDC/AFETR/AFTC(p)/RAEM(a)/RAEM(d)/ESD(dp) HQ
 ACCESSION NR: AP4047579 S/0103/64/025/010/1484/1492

AUTHOR: Gukovskiy, D. E. (Moscow) B

TITLE: Statistical approach to detecting events in automatic monitoring

SOURCE: Avtomatika i telemekhanika, v. 25, no. 10, 1964, 1484-1492

TOPIC TAGS: automatic control,⁹ automatic control design, automatic control system, automatic control theory, automatic monitoring

ABSTRACT: The problem of detecting events in a space Γ is treated as a statistical problem of event detection on the basis of distorted or incomplete data; both kinds of errors — false detection and missing detection — are involved. The use of results of measuring the direct physical quantities correlated to the quantities that determine the events being monitored is considered. A detection algorithm is selected which, in fact, is a rule for converting the observation space into a decision space Δ whose elements are possible decisions γ or

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L 19453-65
ACCESSION NR: AP4047579

monitored events. Two automatic-monitoring systems of dual (from two regions of the observation space) detection are analyzed; their merits are compared on the basis of cost of detection errors. The theory permits selecting an economically substantiated monitoring method for a given risk function. In cases when the risk function is directly estimable, a simple appraisal of the pragmatic value of the information used for selecting the monitoring system can be obtained. Orig. art. has: 2 figures and 47 formulas.

ASSOCIATION: none

SUBMITTED: 24Mar64

ENCL: 00

SUB CODE: IE

NO REF SOV: 002

OTHER: 002

Cord 2/2

KOLOMIYCHENKO, A.I., zasluzhennyy deyatel' nauki, prof.; GUKOVICH, V.A.,
mladshiy nauchnyy sotrudnik; YASHAN, I.A., aspirant.

Method and technic for surgery on the stapes in otosclerosis.

Zhur. ush., nos. i gorl. bol. 20 no.1:17-31 Ja-F '60,

(MIRA 14:5)

1. Iz kafedry bolezney ukha, gorla i nosa (zav. - zasl. deyatel'
nauki prof. A.I.Kolomiychenko) Kiyevskogo instituta usovershenstvo-
vaniya vrachey i surdologicheskoy laboratorii Kiyevskogo instituta
ortopedii i travmatologii.

(OTOSCLEROSIS)

(EAR—SURGERY)

GUKOVICH, V.A.

Results of the work of the extended Plenum of the Board of the
Ukrainian Otolaryngological Society Jointly with the Interprovince
Conference (Stalino and Lugansk Provinces). Zhur. ush., nos. 1
gorl. bol. 20 no.5:90-96 S-0 '60. (MIRA 14:6)
(UKRAINE--OTOLARYNGOLOGICAL SOCIETIES)

GUKOVICH, V.A., mladshiy nauchnyy sotrudnik

State of hearing in otosclerosis at a late period following an operation for indirect mobilization of the stapes. Zhur. ush., nos. i gorl. bol. 20 no.6:25-32 N-D '60. (MIRA 15:2)

1. Iz nauchno-issledovatel'skoy surdologicheskoy laboratorii i otorinolaringologicheskoy kafedry (zav. - zasluzhennyy deyatel' nauki prof. A.I.Kolomiychenko) Kiyevskogo instituta usovershenstvovaniya vrachey.

(EAR SURGERY)

(OTOSCLEROSIS)

GUKOVICH, V. A., Cand. Medic. Sci. (diss) "Operation for Indirect Mobilization of "Stremen!" in Cases of Otosclerosis," Kiev, 1961, 19 pp. (Kiev Med. Inst.) 300 copies (KL Supp 12-61, 284).

KOLOMIYCHENKO, A.I., zasluzhennyy deyatel' nauki prof.; GUKOVICH, V.A.

Report on the activity of the Kiev Province Otolaryngological Society for 1960. Zhur. ush., nos. i gorl. bol. 21 no.1:93-96 Ja-F '61. (MIRA 14:6)

1. Predsedatel' Kiyevskogo oblastnogo nauchnogo obshchestva otolaringologov (for Kolomiychenko). 2. Sekretar' Kiyevskogo oblastnogo nauchnogo obshchestva otolaringologov (for Gukovich).

(KIEV PROVINCE—OTOLARYNGOLOGICAL SOCIETIES)

KOLOMIYCHENKO, A.I., zasluzhennyy deyatel' nauki, prof.; GUKOVICH, V.A.,
mladshiy nauchnyy sotrudnik

Possible ranges in the use of surgery for mobilizing the stapes.
Zhur. ush., nos. 1 gorl. bol. 21 no.5:6-12 S-0 '61. (MIRA 15:1)

1. Iz Nauchno-issledovatel'skogo instituta otolaringologii (dir. -
zasluzhennyy deyatel' nauki prof. A.I.Kolomiychenko);
(EAR SURGERY)

KOLOMIYCHENKO, Aleksey Isidorovich; GUKOVICH, Valeriya Aleksandrovna;
KHARSHAK, Yevgeniy Mikhaylovich; YASHAN, Ivan Artemovich;
YEVDOSHCHENKO, Ye.A., red.; GITISHTEYN, A.D., tekhn. red.

[Operations on the stirrup in otosclerosis] Operatsii na stre-
meni pri otoskleroze. Pod obshchei red. A.I.Kolomiichenko.
Kiev, Gosmedizdat USSR, 1962. 280 p. (MIRA 16:1)
(OTOSCLEROSIS) (TYMPANAL ORGAN--SURGERY)

GUKOVICH, V.A.

Use of prosthesis in operations on the stapes; survey of the
literature. Zhur.ush., nos.i gorl.bol. 21 no.6:77-80 N-D '61.
(MIRA 15:11)

(EAR—SURGERY)

(PROSTHESIS)

KOLOMIYCHENKO, A.I., zasluzhennyy deyatel' nauki, prof.; GUKOVICH, V.A.,
kand.med.nauk

Report of the activity of the Kiev Province Scientific Society
of Otolaryngologists for 1961. Zhur.ush., nos.1 gorl.bol. 22
no.2:91-96 Mr-Apr '62. (MIRA 15:11)

1. Predsedatel' Kiyevskogo oblastnogo nauchnogo obshchestva
otolaringologov (for Kolomiychenko). 2. Sekretar' Kiyevskogo
oblastnogo nauchnogo obshchestva otolaringologov (for Gukovich).
(KIEV PROVINCE--OTORHINOLARYNGOLOGICAL SOCIETIES)

GU KOVICH, V.A., kand.med.nauk

Bone conductivity in otosclerosis. Zhur.ush., nos.1 gorl. bol.
22 no.4:18-24 J1-Ag '62. (MIRA 16:2)

1. Iznauchno-issledovatel'skogo instituta otolaringologii
Ministerstva zdavookhraneniye UkrSSR (dir. - zasluzhennyy
deyatel' nauki prof. A.I. Kolomiychenko).
(OTOSCLEROSIS) (HEARING)

GUKOVICH, V.A., kand.med.nauk

Surgery performed on otosclerosis patients with complete ossification of the fenestra ovalis. Zhur.ush., nos.1 gor.bol.22 no.6: 43-47 N-D°62. (MIRA 16:7)

1. Iz Nauchno-issledovatel'skogo instituta otolaringologii Ministerstva zdravookhraneniya UkrSSR (dir.-zasluzhennyi deyatel' nauki prof. A.I.Kolomyichenko).
(EAR--SURGERY) (OTOSCLEROSIS)

GUKOVICH, V.A., kand.med.nauk (Kiyev)

Importance of some clinical audiometrical data in the determination of ankylosis variants of the stapes in otosclerosis. Zhur. ush., nos.i gorl. bol. 23 no.4: 6-14 J1-Ag'63. (MIRA 16:10)

1. Iz Nauchno-issledovatel'skogo instituta otolaringologii Ministerstva zdravookhraneniya UkrSSR (direktor i nauchnyy rukovoditel' - zasluzhennyy deyatel' nauki prof. A.I. Kolomiychenko).

(AUDIOMETRY) (OTOSCLEROSIS) (ANKYLOSIS)

GUKOVICH, V.A., kand. med. nauk

Unusual form of chronic catarrhal otitis. Zhur. ush., nos.
1 gorl. bol. 23 no.1:78-79 Ja-F '63. (MIRA 17:2)

1. Iz surdologicheskogo otdela Nauchno-issledovatel'skogo
instituta otolaringologii Ministerstva zdravookhraneniya
UkrSSR (dir. - zasluzhennyy deyatel' nauki prof. A.I.
Kolomiychenko).

GUKOVICH, V.A., kand. med. nauk

Surgical methods of treating deafness in otosclerosis with complete obliteration of the oval fenestra. Zhur. ush., nos. i gor. bol. 24 no.1:18-25 Ja-F '64. (MIRA 18:3)

1. Iz Nauchno-issledovatel'skogo instituta otolarinologii Ministerstva zdravookhraneniya UkrSSR (nauchnyy rukovoditel' - zasluzhennyy deyatel' nauki prof. A.I. Kolomiychenko).

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L 41182-65 EWT(d)/EWP(c)/EWP(v)/T/EWP(k)/EWP(l) Pf-4
ACCESSION NR: AP5004677 S/0115/64/000/009/0058/0059
70
18
8

AUTHOR: none

TITLE: Fourth scientific and technical conference on "Cybernetics for the improvement of measurement and inspection methods"

SOURCE: Izmeritel'naya tekhnika, no. 9, 1964, 58-59

TOPIC TAGS: cybernetics, electric measurement, ^{9M}electric quantity instrument, digital computer, electronic equipment, electric engineering conference

ABSTRACT: The conference was held 1-4 July at the All-Union Scientific Research Institute of Metrology by the Section of Electrical Measurements of the Council on the Problem of "Scientific Instrument Making" of the State Committee on Coordination of Scientific Research Work in the USSR together with the All-Union Scientific Research Institute of Electrical Measurement Instruments and the Leningrad Regional Administration of the Scientific and Technical Division of the Instrument Making Industry. More than 400 delegates from 29 cities of the country participated. Fifty-seven reports were heard and discussed. Reports were given by: P. V. NOVITSKIY (Leningrad)--"Definition of the Concept of Informational Error in Measurement and its Importance in Practical Use" and "On the Problem of the Average Informational Criterion of Accuracy Throughout the Entire Scale of an Instrument"; Ya. A.

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ACCESSION NR: AP5004677

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KUPERSHIDT (Moscow)--"On Determination of the Criteria of Accuracy for Measurement Devices"; S. M. MANDEL'SHTAM (Leningrad)--report on a new criterion of accuracy of measurement instruments; P. F. PARSHIN (Leningrad)--report on optimization when using Fourier transforms on electronic digital computers; S. P. DMITRIYEV, G. Ya. DOLGINTSEVA and A. A. IGNATOV (Leningrad)--proposal of a new method for solving problems of optimum filtering for non-stationary random signals and interference; I. B. CHSLFANOV--"Calculation of the Dynamic Characteristics of an Optimum Complex Two-Channel System which Uses Signals from a Position Meter and from a Speed Meter"; R. A. POLUEKTOV (Leningrad)--"Optimum Periodic Correction in the Measurement of Continuous Signals"; S. P. ADAMOVICH (Moscow)--"Analysis and Construction of Devices for Correction of Non-linearity and Scaling for Unitary Codes"; G. V. GORBLOVA (Taganrog)--"A Method for Statistical Optimization in Graduating the Scales of Electrical Measuring Instruments"; M. A. ZENEL'MAN (Moscow)--"Analog-Digital Voltage Converter with Automatic Error Correction"; B. N. MALINOVSKIY, V. S. KALENCHUK and I. A. YANOVICH (Kiev)--"Automatic Monitoring of the Parameters of the Electrical Signals of Complex Radio and Electronic Equipment"; V. P. PEROV (Moscow)--"Operational Cybernetics as an Independent Scientific Specialization"; Ye. N. GIL'BO (Leningrad)--"On the Problem of Effective Non-linear Scales"; A. I. MARKELOV (Moscow)--"Devices for Preliminary Processing of the Results of Measurements Presented in the Form of

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L 41182-65

ACCESSION NR: AP5001677

20

Graphic Recordings For Subsequent Introduction of the Information into Universal Digital Computers"; O. M. MOGILEVER and S. S. SOKOLOV (Leningrad)--"On a Method for Reducing Excess Information"; T. V. NIKOLAYEVA (Leningrad)--"A Device for Temporal Discretization of Continuous Signals"; A. A. LYOVIN and M. L. BULIS (Moscow)--"Optimization of the Transmission of Telemetric Information as a Means for Raising the Efficiency and Eliminating Interference"; D. E. GUKOVSKIY (Moscow)--"On a Statistical Approach to the Detection of Events in Automatic Inspection"; M. I. LANIN (Leningrad)--"Method for Calculating the Holding Time of Communications in a Centralized Inspection System or Constant Servicing Time"; O. N. BRONSHTEYN, A. L. RAYKIN and V. V. RYKOV (Moscow)--"On a Single-Line Mass Service System with Losses"; V. M. SHLYANDIN (Penza)--report on circuit designs for direct compensation electrical digital measuring instruments; A. N. KOMOV (Novocherkassk)--report on a new method for compensation of digital bridges; M. N. GLAZOV (Leningrad)--report on the problem of voltage-to-angular rotation conversion; V. S. GUTNIKOV (Leningrad)--"Methods for Construction of Frequency Capacitance Pickups with a Linear Scale"; R. Ya. SYROPYATOVA and R. R. KHARCHENKO (Moscow)--report on the determination of the amplitude-frequency and phase characteristics of PPM and PWM modulators; Ye. I. TENTAKOV (Novocherkassk)--"The Phototransistor as a Switch for Electrical Measurement Purposes"; N. V. MALYGINA (Leningrad)--a report on ways for making universal equipment for measurement of current, voltage and power; P. P. ORNATSKIY and V. I. ZOZULYA (Kiev)--reports on the construction of static voltmeters, wattmeters, and

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ACCESSION ID: AP5004677

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phase motors; A. V. TRIKHANOV, I. G. SMYSHLYAYEV, N. I. SABLIN, V. N. RAZIN and V. A. GORBUNOV (Tomsk)--report on a device for automatic processing of the measurements of vibration amplitude of pneumatic hammers; L. K. RUKINA and V. G. KNORRING (Leningrad)--report on the development of a digital compensator for measuring pressure, force, etc.; N. B. DADUKINA (Leningrad)--report on a method for constructing frequency pickups for gas analysis; Ye. M. KARPOV, V. A. BRAZHNIKOV and B. Ya. LIKHITSINDER (Kuybyshev)--reports on analysis and recording of boring speeds; Yu. V. PSHENICHNIKOV (Kuybyshev)--"A High Speed Voltage-to-Digital Code Converter for ac Pickups"; G. P. VIKHROV and V. K. ISAYEV (Vilna)--"A Highly Accurate Digital Peak-to-Peak Voltmeter"; and S. M. PERSIN (Leningrad)--"A Low Level Analog-Digital Voltage Converter."

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: EE, EO

NO REF SOV: 000

OTHER: 000

JPRS

me
Card 4/4

GUKOVSKIY, D.E. (Moskva)

Statistical approach to the detection of events in automatic
control. Avtom. i telem. 25 no.10:1484-1492 0 '64.

(MIRA 17:12)

L 45873-66

ACC NR: AP6013105

(A)

SOURCE CODE: UR/0231/65/000/007/0006/0011

AUTHOR: Shevchenko, L. A. (Candidate of technical sciences); Gromov, S. A. (Candidate of technical sciences); Gukovskiy, G. Ye. (Engineer)

ORG: None

TITLE: Experimental gas-turbine train of TanII MPS

SOURCE: Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut zheleznodorozhnogo transporta. Vestnik, no. 7, 1965, 6-11

TOPIC TAGS: railway transportation, railway vehicle data, railway equipment, gas turbine engine, electric generator, electric motor, *locomotive*

ABSTRACT: A general description of an experimental railway gas-turbine motor car with an a-c propulsion system is presented. The motor-car propulsion system consists of a gas-turbine engine, one 3-phase synchronous generator and two traction induction motors with rotors of squirrel cage type. The generator excitation system is fed from an exciter mounted on the turbocompressor shaft. The auxiliary generator used for feeding lighting and control circuits and for charging storage batteries is also mounted on the same shaft. The experimental research is conducted in two stages of which the first one covers the preliminary investigations with one motor car while the second stage deals with a two-car train. The data on the 350-hp gas-turbine engine, the 400-v, 450-amp, 50-cps generator

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UDC: 625.282-843.8

L 45873-66

ACC NR: AP6013105

and 40/55-kw, 380-v induction motor are presented in tables. A general view of the motor car is shown in a photo. Electric circuit diagrams are presented for one-car and two-car versions. The arrangement of the equipment inside the motor car is also illustrated. The installation and operation of the equipment is discussed including the control of speed, reversal of rotation and brake actions. Speed-traction curves (experimental and theoretical) are established and plotted for a two-car train. It is concluded, that the investigated and tested propulsion system can successfully be used for electric railway traction. A further research and development of large gas-turbine motor cars and trains with an a-c propulsion system is strongly recommended. Orig. art. has: 5 figures.

SUB CODE: 13, 21, 09/SUBM DATE: None/ ORIG REF: 003

Card

2/2 ULR

GUK'YANOV, M. P.

GUK'YANOV, M. P. : "The characteristics of equations of nonlinear mechanics included in a special first-group point." Min Higher Education USSR. Uzbek State U inani Alisher Navoi. Samarkand, 1956. (Dissertation for the Degree of Candidate in Physicomathematical Science.)

Knizhnaya letopis', No. 30, 1956. Moscow.

14.3400

34575

S/044/62/000/001/021/061

C111/C444

AUTHOR: Guk"yamukhov, M. B.

TITLE: The expansion of the solution of the equation of Briot and Bouget in the neighborhood of the origin

PERIODICAL: Referativnyy zhurnal, Matematika, no. 1, 1962, 35-36, abstract 1B175. ("Tr. Uzb. un-ta", 1958, vyp 78, 71-104)

TEXT: Considered is the differential equation

$$x^m y' = a_0(x) + a_1(x) y + a_2(x) y^2 + \dots \equiv f(x, y), \quad (1)$$

where $m \geq 1$ is an integer, the functions $a_k(x)$, $k = 0, 1, 2, \dots$ being analytic in the neighborhood of $x = 0$, $a_0(0) = 0$, $a_1(0) > 0$, the function $f(x, y)$ being analytic in a certain neighborhood of $x = 0$, $y = 0$. It is known that there exists a domain $D(0 < x \leq a, |y| \leq b)$ such that at an arbitrary point $(x_0, y_0) \in D$ the solution $y = y(x, x_0, y_0)$ of (1) which passes through this point has the property: $y(x, x_0, y_0) \rightarrow 0$ for $x \rightarrow 0$. In the article it is shown in

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The expansion of the solution of ...

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C111/C444

case of a and b being sufficiently small (estimations are given), the solution $y(x, x_0, y_0)$ for arbitrary $(x_0, y_0) \in D$ in the interval

$(0, x_0]$ can be represented by the convergent series

$$y = \sum_{k=1}^{+\infty} \varphi_k(x, x_0, y_0) \quad (2)$$

where the functions $\varphi_k(x, x_0, y_0)$ are calculated successively as the solutions of certain linear differential equations. The method of construction of (2) differs from the corresponding method of Bendixon.

[Abstracter's note: Complete translation.]

Carl 2/2

GUL', A.P.; SAVCHENKO, O.N.; STEPANOV, G.S.

Study of the estrogens in the daily urine of cattle. Fiziol. zhur.
48 no.1:91-94 Ja '62. (MIRA 15:2)

1. From the Laboratory for Physiology of Farm Animals and the
Laboratory of Human Physiology and Pathology of Ageing, I.P.Pavlov
Institute of Physiology, Leningrad.
(ESTROGENS) (URINE ANALYSIS AND PATHOLOGY)

GUL', A.P.

Variations in the estrogenic function in dairy cattle due to external factors. Dokl. AN SSSR. 144 no.6:1418-1421 Je '62. (MIRA 15:6)

1. Institut fiziologii im. I.P.Pavlova Akademii nauk SSSR. Predstavleno akad. V.N.Chernigovskim.
(ESTRUS) (DAIRY CATTLE)

GUL', A.P.

Stimulation of the reproductive function in cattle in
various phases of the sexual cycle. Fiziol.zhur. 51
no.11:1363-1369 N '65. (MIRA 18:11)

1. Institut fiziologii imeni I.P.Pavlova AN SSSR, Leningrad.

MLADENOV, Iv.; NIKOLINSKI, P.; GUL, E. V.; PETROV, N.

The influence of the branching polymers on their compatibility in blocks and solution. Doklady BAN 14 no.6:615-618 '61.

1. Vorgelegt von Akademiemitglied D. Ivanov.

Gul', I. M. Topological incidence formula. Doklady Akad. Nauk SSSR (N.S.) 86, 895-898 (1947). (Russian)

This note extends the Lefschetz fixed point relation [reference to S. Lefschetz, Trans. Amer. Math. Soc. 28, 1-49 (1926)] to a more general many-valued continuous map T of a closed orientable manifold M^n on itself, $m \in M^n \rightarrow T(m) \subset M^n$. Points m for which $m \in T(m)$ are called the fixed points, or the incidence points. It is postulated of the transformation that the graph Γ of the mapping is the carrier of some cycle Γ^{n+p} . The graph Γ is a subset of $M^n \times M^n$; in this topological product M^n is a copy of M^n . To each cycle γ^p of M^n corresponds a cycle $T(\gamma^p)$ defined by means of the cycle $\Gamma^{n+p} = \Gamma^{n+p} \cdot [\gamma^p \times M^n]$ as the copy in M^n of the projection of Γ^{n+p} into M^n . The important incidence cycle ξ^p is defined by means of the cycle $\Gamma^p = \Gamma^{n+p} \cdot \Gamma_0$, where Γ_0 is the cycle based on the graph of the identity map T_0 of M^n upon itself. Now let γ_i^p be an independent homology basis for M^n , γ_i^{n-p} the dual basis, and P_i the i th Betti number. The author establishes the formula:

$$\xi^p \approx \sum_{i=1}^{n-p} (-1)^i \sum_{j=1}^{P_j} T(\gamma_j^i) \cdot \gamma_i^{n-p}.$$

This reduces to the Lefschetz formula when $p=0$.

L. Zippin (Flushing, N. Y.).

Source: Mathematical Reviews, 1948, Vol 9, No. 3

GUL, I.M.

V GUL, I.M. Cauchy's problem for some partial differential equations with functional arguments. Uspehi Mat. Nauk 10, no. 2(64), 153-156 (1958). (Russian)
The author considers equations

(1) $\Phi(x, u(x), u_{x_i}(x)) = 0$ ($i, j = 1, \dots, n; k = 1, \dots, K$),
where $u(x) = u(x_1, \dots, x_n)$, $x_i = x_i(x_1, \dots, x_n)$ and the functions Φ, x_i are continuously differentiable up to order two in a certain domain. Under suitable additional hypotheses it is indicated how the problem of Cauchy for (1) can be solved by utilizing a suitably modified method of Cauchy (used by the latter for the Cauchy problem and involving the use of characteristics). Similar indications are given for the second-order quasi-linear equation

$$\sum_{i,j=1}^n a_{ij}(x, u(x)) u_{x_i x_j}(x) + b(x, u(x)) = 0.$$

W. J. Trjitzinsky (Urbana, Ill.)

L 13248-63

EWI(d)/FCC(w)/BDS

AFTTC

IJP(G)

S/044/63/000/003/023/047

AUTHOR: Gul', I. M.

TITLE: Partial differential equations with functional arguments

PERIODICAL: Referativnyy Zhurnal, Matematika, No. 3, 1963, 51, Abstract 3B233
(Tr. Seminara po Teorii Differents. Uravneniy s Otklonvayush-
chimsya Argumentom, Un-t Druzhby Narodov im. Patrisa Lumumby, no. 1,
1962, 94-102)

TEXT: The author examines the possibility of applying classical methods to the solution of certain partial differential equations with functional arguments. He cites the equation

$$\Phi \left[x_i, u(\alpha_i^k), \frac{\partial u(x_i)}{\partial x_j} \right] = 0$$

(i, j = k, 2, ..., n; k = 1, 2, ..., K), where $u(x_i)$ is the sought function of n independent arguments $(x_i) = (x_1, x_2, \dots, x_n)$; the $u(\alpha_i^k)$ are functions of functions in the independent variables $\alpha_i^k = \alpha_i^k(x_1, x_2, \dots, x_n)$. In

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L 13248-63

S/044/63/000/003/023/047

Partial differential equations ...

order to solve the Cauchy problem in this case one may apply the method of characteristics with certain changes in the construction of the solution and in the proof of its existence. Here the author points out only the basic differences from the usual classical case. He then investigates quasi-linear equations in which functional arguments appear only in the unknown function

$$\sum_{j=1}^n \frac{\partial u(x)}{\partial x_j} a_j(x, u(a^k)) + b(x, u(a^k)) = 0,$$

to which one may also apply the method of characteristics. In the case of hyperbolic equations the method of successive approximations is applicable to the solution of the Cauchy problem; at the same time, differences between the proofs in this case and those of the classical case are indicated.

Card 2/3

GUL, K.K.; SZATMARI, Antal

Development of geographical sciences in Azerbaijan. Foldr kozl
9 no.1:95-97 '61.

CHEPIGIN, G. V., inzh.; NEKHAY, S. M., inzh.; GUL', N. S., inzh.;
CHIZHOV, A. P., inzh.

Replacing the double-cleaning oil filter with a full-flow
centrifuge. Mashinostroenie no.5:95 S-O '62.
(MIRA 16:1)

(Tractors—Engines—Oil filters)

CHEPIGIN, G.V., kand.tekhn.nauk; GUL', N.S., inzh.; CHIZHOV, A.P., inzh.
KHESIN, A.Ya.

Results of the operational tests of a full-flow RMTs device on the
SMD diesel engine. Trakt. 1 sel'khoz mash. 32 no.6:12-14 Je '62.
(MIRA 15:6)

1. Dnepropetrovskiy sel'skokhozyaystvennyy institut (for Chepigin,
Gul', Chizhov). 2. Gosudarstvennoye spetsial'noye konstruktorskoye
byuro po dvigatelyam (for Khesin).
(Tractors—Oil filters)

CHEPIGIN, G.V.; GUL', N.S.; CHIZHOV, A.P.

Experiments in the use of cast iron crankshafts in tractor diesel engines. Trakt. i sel'khoz mash. 33 no.8:44-45 Ag '63. (MIRA 16:11)

1. Dnepropetrovskiy sel'skokhozyaystvennyy institut.

CHEPIGIN, G.V., kand. tekhn. nauk; GUL', N.S., inzh.; CHIZHOV, A.P., inzh.

Use of cast-iron crankshafts in motor-vehicle and tractor engines.
Mashinostroenie no.5:112-113 S-O '63. (MIRA 16:12)

1. Dnepropetrovskiy sel'skokhozyaystvennyy institut.

GUL', S.M. (Moskva)

Some means of stimulating the work of students in mathematics
lessons. Mat.v shkole no.6:27-30 N-D '62. (MIRA 16:1)
(Mathematics—Study and teaching)

GUL', Sergey Mikhaylovich; KAMEL V, Nikolay Pavlovich; KOPYLOV, Boris Mikhaylovich; KRUKOVSKIY, Ignatiy Vladislavovich; NEDOSEKIN, Dmitriy Fedorovich; SEMERIKOV, Ivan Vasil'yevich; BARINOV, V.A., prof., doktor, retsenzent; KHEZNOV, L.S., prof., doktor, retsenzent; KRASNOSHCHEKOV, A.M., prepodavatel', retsenzent; POLUNICHEV, I.A., red. izd-va; BACHURINA, A.M., tekhn. red.

[Laboratory manual of geodesy] Rukovodstvo dlia prakticheskikh zaniatii po geodezii. Moskva, Goslesbunizdat, 1960. 266 p. (MIRA 14:7)

1. Moskovskiy lesotekhnicheskii institut (for Barinov). 2. Moskovskiy institut inzhenerov vodnogo khozyaystva imeni Ye.R.Vil'yamsa (for Kheznov). 3. Tsentral'nyy zaochnyy lesotekhnicheskii tekhnikum (for Krasnoshechekov)

(Surveying—Handbooks, manuals, etc.)

GUL', S.M. (Moskva)

"Educational conferences" in Moscow in 1963. Mat v shkole no.5:
84 S-0 '63. (MIRA 16:11)

Gul', V. Ye.

94-1-14/24

AUTHORS: Gul', V. Ye., Mayzel', N.S., Frenkel', S.N. and Khmunin, S.F.

TITLE: The Insulation of Live Parts in Packaged and Assembled High- and Low-voltage Equipment (Izolyatsiya tokovedushchikh chastey v komplektnykh i sbornykh ustroystvakh vysokogo i nizkogo napryazheniya)

PERIODICAL: Promyshlennaya Energetika, 1958, No.1, pp. 29 - 31 (USSR)

ABSTRACT: Extensive use is now being made of prefabricated and packaged high- and low-voltage distribution equipment. In general, Soviet equipment of this kind is larger than foreign equivalents, which is wasteful in sheet steel, aluminium bus-bars, etc. Current-carrying parts are usually bare and are mounted on ceramic or plastic insulators; clearances are consequently large. By insulating these parts, the equipment could be made smaller. This short article describes appropriate materials and methods. Yu.F. Voronkov, N.S. Il'in and Ya.N. Kaplunov participated in the development of suitable insulation. After considerable experimental work, it was decided to investigate a number of polymers including p.t.f.e., poly-amide resin 548, polyvinylbutyral, butadiene-styrol rubber and silicone rubber. The most suitable material was found to be polyethylene. In the early stages of the work, films of the

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94-1-14/24

The Insulation of Live Parts in Packaged and Assembled High- and Low-voltage Equipment

material were applied to the conductors, but this was not very satisfactory. The best method proved to be hot-spraying with a special pistol. Air with powdered insulating material in suspension is heated by an acetylene flame so that the particles in molten and plastic form adhere to and build up on surfaces with which they come in contact. The equipment used to apply insulation in this way is illustrated diagrammatically. A polyethylene layer 0.9 mm thick was maintained in a humidity chamber for 24 hours and then tested for five minutes at a voltage of 5 kV/mm without breakdown. The material was also tested after exposure to heat, light, frost, vibration and water and was generally satisfactory. It is concluded that polyethylene insulation of appropriate thickness applied in this way can be used in distribution equipment for 6 - 10 kV. The work continues. There is 1 figure.

AVAILABLE: Library of Congress

Card 2/2

Card 1/2

TEXT: This is the reproduction of a report made at the Conference on the Strength of Polymers, May 16-18, 1960. The report presents a theoretical interpretation of the behavior of polymers in tensile tests, developed by Katedra khimii i fiziki polimerov i protsessov ikh pererabotki MITSHT im. Lomonosova (Department of Chemistry and Physics of Polymers and of Processes of Their Treatment, Moscow Institute of Fine Chemical Technology, iment Lomonosov) and fizicheskaya laboratoriya NIIRP (Physical Laboratory of the Scientific Research Institute of the Rubber Industry). Mention is made of tensile tests performed with a Schapper dynamometer, a PM-60 (RM-60) dynamometer, and a CK-1 (SKS-1) time-lapse camera. In addition, motion pictures have been taken of the rupture of polyethylene terephthalate in polarized light. Summing up: 1) The strength of polymers, like that of other substances, is of a statistical nature. As

PERIODICAL: Plasticheskiye massy, no. 1, 1961, 54-58

TITLE: Strength of polymers

AUTHORS: Bartenev, G. M., Gul', V. Ye.

S/191/61/000/001/012/015
B101/B205

Card 2/2

a result, the values are spread and depend on the size of the specimens. 2) The rupture of polymers, like that of other substances, is a time-dependent process of two stages: a slow stage corresponding to the development of "notches" (inhomogeneities) in the orientated material, and a rapid stage corresponding to the development of cracks, which can take place also in material without orientation. Depending on the conditions of deformation, there is either one stage or two stages following each other. 3) The structure and properties of elastomers change at the instant of rupture. 4) The structure of elastomers at sites where inhomogeneities are growing differs from the structure of the whole specimen. This difference is characterized by the degree, γ , of additional deformation. 5) The strength of polymers depends on γ . If the latter is considerably changed by certain factors (temperature, high deformation rate), an anomalous behavior may occur. 6) By changing temperature and deformation rate it is possible to break polymers according to different mechanisms, each of which is characterized by a specific behavior. There are 12 figures and 11 references: 10 Soviet-bloc and 1 non-Soviet-bloc.

Strength of polymers

B101/B205

S/191/61/000/001/012/015

L 17798-63

ACCESSION NR: AP3006621

8
ABSTRACT: The adhesion of polymers to metals has been studied by determining the dependence of the adhesive bond strength on temperature and by calculating the "apparent activation energy of adhesion" (E). P-85 polyisobutylene (molecular weight 93,000), SKB-35 sodium butadiene rubber, or SKN-18 or SKN-40 butadiene-acrylonitrile copolymers were used as adhesives, and Cu or Al foil, as substrates. The adhesive bonds were subjected to stripping tests at -100—+60C on a modified TsNIKZ adhesion testing machine (S. S. Voyutskiy, Yu. I. Markin, Zavodsk. laboratoriya, No. 10, 1203, 1962). The type of failure was determined by electron microscopic and luminescence methods also described in the study cited. The dependence of adhesive bond strength on temperature is given in the form of plots in Figs. 1 and 2 of the Enclosure. On the basis of these plots, the following conclusions are reached: 1) The magnitude and temperature dependence of polymer-to-metal adhesive strength is determined mainly by the nature of the polymer rather than by that of the metal. 2) At room temperature the adhesive strengths of the various polymers to metals are close in value; at lower and higher temperatures they vary considerably.

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L 17798-63
PB-4/PC-4/Pr-4

EPR/EWP(j)/EPF(c)/EWP(q)/EWT(m)/BDS
RM/MAY/WW/HM/JD

APFPC/ASD

ACCESSION NR: AP3006621

S/0076/63/037/009/2027/2033 ⁸⁴/₇₅

AUTHOR: Voyutskiy, S. S.; Markin, Yu. I.; Gorchakova, V. M.;
Gul', V. Ye.

TITLE: Adhesion of high polymers to metals. 4. Temperature dependence and activation energy of adhesion

SOURCE: Zh. fizicheskoy khimii, v. 37, no. 9, 1963, 2027-2033

TOPIC TAGS: adhesion, bonding, polymer to metal adhesion, polymer to metal bonding, adhesive strength, adhesive strength temperature dependence, activation energy of adhesion, apparent activation energy, bond, joint, adhesive, polyisobutylene P-85, sodium butadiene rubber SKB-35, butadiene-acrylonitrile copolymer, SKN-18, SKN-40, substrate, copper, copper foil, aluminum, aluminum foil, stripping test, adhesion testing machine, TsNIKZ, failure, failure type, electron microscope method, luminescence method, temperature effect, polar group effect, glass transition temperature, copper catalytic effect, intermolecular force

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L 17798-63

ACCESSION NR: AP3006621

Stripping tests should therefore be conducted in a wide temperature range. 3) An increase in the number of polar groups in the polymer molecule (copolymers SKN-18 and SKN-70) lowers the adhesive strength, owing to a drop in molecule flexibility. 4) Adhesion is lowest in the neighborhood of the glass transition temperature for all bonds except that of polyisobutylene (the causes of this exception require further study). The values of E calculated from $P = P_0 \exp(E/RT)$, where P is the adhesive strength and P_0 is a constant, are given in Table 1 of the Enclosure. The fact that the values of E are higher for Cu than for Al can be ascribed to the catalytic effect of Cu on the polymer and to the formation in the polymer of polar oxygen-containing groups. The magnitudes of E indicate that in the adhesive bonds considered adhesion is due to intermolecular forces rather than to covalent chemical bonds. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii
(Moscow Institute of Fine Chemical Technology)

Card 3/3

L 31803-65 EPA(s)-2/EWT(m)/EPF(c)/ENP(v)/BPR/ENP(j)/T P-4/Fr-1/Ps-4/Pt-10 WH/AM
ACCESSION NR AK5002552 BOOK EXPLOITATION S/

Gul', Valentin YEvgen'yevich (Professor)

^b
Strength of polymers (Prochnost' polimerov), Moscow, Izd-vo "Khimiya", 1964,
227 p. illus., biblio., index. Errata slip inserted. 9,000 copies printed.

TOPIC TAGS: polymer, material strength

PURPOSE AND COVERAGE: This book is the first collection and systematization of the results of Soviet and foreign research on the problem of strength of polymers. The material is illustrated by experimental data obtained in the failure of reinforced plastics, organic glasses, elastomers, fibers, and solid polymer systems with a large degree of transverse joining. Some features of the effect of chemical composition and the size and shape of macromolecules on polymer strength are examined. In the concluding section, the basic theories of the strength of solids and polymers are analyzed. The amount of mathematics used in the book is kept to a minimum. The book is of interest to a broad audience of engineers, technicians, and researchers concerned with the production and use of polymeric materials.

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Ch. IIII. Effect of external factors on the failure process of polymers --- 130

Ch. V. Effect of chemical composition and size and shape of macromolecules on
the strength of polymers -- 159

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SUBMITTED: 28Mar64

SUB CODE: MI

NO REF SOV: 153

OTHER: 127

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L 40010-65 EWI(j)/EWT(m)/EPF(c)/HPF(n)-2/EWG(v)/EWF(v)/EPR/ENP(j)/T/EHA(h)/
EWA(l) Pc-4/Pe-5/Pr-4/Ps-4/Pu-4/Peb RPL GG/RM/WW/GS
ACCESSION NR: AT4049836 S/0000/64/000/000/0008/0012

56
82
84

AUTHOR: Gol'danskiy, V. I.; Gul', V. Ye.; Yegorov, Ye. V.; Zil'berg, G. A.;
Mikhlin, V. E.; Rayevskiy, V. G.

TITLE: A new radiochemical method for preparing graft copolymers, and their possible uses for increasing the bond strength between rubber and fabric

SOURCE: Khimicheskiye svoystva i modifikatsiya polimerov (Chemical properties and the modification of polymers); sbornik statey. Moscow, Izd-vo Nauka, 1964, 8-12

TOPIC TAGS: graft copolymer, bond strength, rubber fabric laminate, neutron irradiation, polycaproamide, elastomer, polymer impregnation, Capron fabric

ABSTRACT: Utilizing the localized effect of neutron irradiation, a new method was developed for obtaining graft copolymers; this was based on the irradiation of emulsions containing both polymer components and a lithium (boron) compound by a flow of thermal neutrons. The graft copolymers tested were obtained by irradiation, in a nuclear reactor, of emulsions made from a mixture of polycaproamide in formic acid, containing a Li compound, with solutions of elastomers in o-xylene. Infrared spectra showed the presence of a radiochemical interaction between the elastomer molecules and polycaproamide with the formation of a graft copolymer.

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ACCESSION NR: AT4049836

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The composition of the resin mixture is tabulated. The resin coating was 0.2-0.02 mm thick. The vulcanized samples were tested on a Schopper apparatus. Tabulated data show that impregnation of Capron fabric with a non-irradiated emulsion decreases the bond strength between rubber and fabric by 30-40%, due to a decrease in the mechanical adhesion and the low cohesive strength of the adhesive. The use of the impregnating solution containing graft copolymer increases the bond strength by 45-60% as compared to the initial value. By combining impregnation of the fabric with a solution of epoxyamide resin (No. 89) and impregnation with a solution of an elastomer and a graft copolymer, the bond strength between the rubber and the fabric was almost doubled as compared to the strength obtained by impregnating only with epoxyamide, and increased four times as compared to materials based on nonimpregnated Capron fabric. Other modifications of the method of localized neutron irradiation permit the bond strength to be increased to 4.1 kg/cm, this value being limited by the cohesion of the rubber coating. This variant of the method will be described in a subsequent publication. Orig. art. has: 1 figure and 3 tables.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Chemical physics institute, AN SSSR); Moskovskiy institut tonkoy khimicheskoy tekhnologii Im. M. V. Lomonosova (Moscow fine chemical technology institute)

SUBMITTED: 18Apr62

ENCL: 00

SUB CODE: OC, NT

6rd 2/2 NO REF SOV: 006

OTHER: 001

L 54706-65 EWT(m)/EPF(c)/EWP(j)/T Pc-L/Pr-L RM

ACCESSION NR: AP5014522

UR/0069/65/027/003/0341/0345

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B

AUTHOR: Gul', V. Ye.; Penskaya, Ye. A.; Kuleznev, V. N.

TITLE: Evaluation of the compatibility of polymers

SOURCE: Kolloidnyy zhurnal, v. 27, no. 3, 1965, 341-345

TOPIC TAGS: polyethylene, solubility, polymer property, viscosity

ABSTRACT: The authors show that deviation of the specific viscosity of a polymer solution from additivity cannot be used as a criterion in evaluating polymer compatibility. Difference fractions of polyethylene taken from one sample served as models of compatibility of polymers. The viscosity of solutions of light and heavy fractions of polyethylene was measured at $75 \pm 0.1^\circ\text{C}$ in a capillary viscosimeter. The solution of the high molecular fraction was dissolved directly in the viscosimeter by the low molecular fraction so that the total concentration of the polymer remained the same but only the ratio of the components changed. It was shown that the experimental curves do not agree with the additive curves even when the mixtures consisted of two fractions of the same polymer. Two compatibility

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ACCESSION NR: AP5014522

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characteristics of polymers are proposed: thermodynamic and technological. The former is determined by the interval of concentrations within which the system remains thermodynamically stable. The latter is determined by the period where changes in the properties of the system do not exceed the permissible limits during practical use of the polymer mixture. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Moskovskiy tekhnologicheskii institut myasnoy i molochnoy promyshlennosti (Moscow Technological Institute of the Meat and Dairy Industry); Moskovskiy institut tenkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 02Jan64

ENCL: 00

SUB CODE: 00

NO REF SOV: 006

OTHER: 001

Card 2/2

mb

L 41163-65 EWT(m)/EPF(c)/ENP(j)/EPR/ENP(j)/T Ps-4/Pr-4/Ps-4 RM/WH
 ACCESSION NR: AP5007169 S/0206/65/000/003/0030/0032 31

AUTHOR: Gul', V. Ye.; Shenfil', L. Z.; Mel'nikova, G. K.; Porosyatnikova, T. F.;
 Pil'menshteyn, I. D.

TITLE: Adhesive Paste. Class 22, No. 167927 15

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 3, 1965, 39

TOPIC TAGS: adhesive material, epoxy resin

ABSTRACT: This Author's Certificate introduces an adhesive paste based on epoxy resin plasticized with Thiokol and hardened with amines or anhydrides of dibasic acids. In order to produce an electrically conductive paste with low resistivity and a low temperature coefficient of resistance, nickel powders with various particle sizes are added.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovykh i lateksnykh izdeliy
 (Scientific Research Institute of Rubber and Latex Products)

SUBMITTED: 04Jan64

ENCL: 00

SUB CODE: MT

NO REF SOV: 000

OTHER: 000

Card 1/1 mel

L 13916-66 EWT(m)/ENP(j)/T/ETC(m)-6 FM/WW

ACC NR: AP5027843

SOURCE CODE: UR/0020/65/165/001/0110/0113

AUTHORS: Gul', V. Ye.; Lyubeshkina, Ye. G.

ORG: Moscow Technological Institute for Meat and Dairy Industry (Moskovskiy tekhnologicheskii institut myasnoy i molochnoy promyshlennosti)

TITLE: Investigation of the interaction products of polypropylene with alkali sulfate lignin

SOURCE: AN SSSR. Doklady, v. 165, no. 1, 1965, 110-113

TOPIC TAGS: polymer, polypropylene, polymer chemistry, high polymer, tensile strength

ABSTRACT: The effect of adding alkali sulfate lignin and dioctylsebacinate plasticizer to polypropylene was studied to increase the strength of polypropylene at low temperatures. The reaction was carried out at 220C. The degree of swelling in decalin solution, the deformation at 130C, and the strength of the modified polypropylene as a function of lignin concentration were determined. The experimental results are summarized graphically (see Fig. 1), and a reaction mechanism is proposed. It was found that the strength of the modified polymer did not differ significantly from that of the original polymer, but that the addition of 15% of plasticizer and 4% of lignin lowered the thermal stability limit from -18C (for the original polymer) to -65C. The authors thank V. A. Kargin for his advice and

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UDC: 541.6.68

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ACC NR: AP5027843

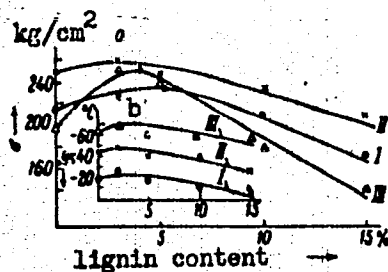


Fig. 1. (a) Dependence of tensile strength of modified polypropylene on the concentration of lignin; (b) change of low temperature strength limit (Ts) with the change in the lignin concentration in the modified polypropylene: I - original polypropylene, II - polypropylene with 7% dioctylsebacinate; III - polypropylene with 15% dioctylsebacinate.

critical review of the present paper. This paper was presented by V. A. Kargin on 12 May 1965. Orig. art. has: 3 graphs and 2 equations.

SUB CODE: 011/ SUBM DATE: 29Apr65/ SOV REF: 005/ OTH REF: 001

Card 2/2

L 14611-66 FWT(m)/FWP(j) RM

ACC NR: AP6001498

SOURCE CODE: UR/0191/65/000/012/0024/0026

AUTHORS: Yermilova, G. A.; Rogovaya, E. M.; Gul', V. Ye.

36
32
B

ORG: none

TITLE: Investigation of crystallinity and orientation during processing of polypropylene film by extrusion and pneumatic stretching

SOURCE: ^{6 20 56}Plasticheskiye massy, no. 12, 1965, 24-26

TOPIC TAGS: polypropylene plastic, polycrystalline film, crystal orientation / ISO-tk-61 method, ^{2b}UP-30 ¹⁰pneumatic stretching machine

ABSTRACT: Results from the investigation of the changes in crystallinity and orientation in polypropylene during the process of film formation are presented. This work is a continuation of a series of reports on factors affecting the polypropylene film processing and its mechanical properties (G. A. Yermilova, I. Ya. Slonim, and Ya. M. Urman, Plast. massy, No. 11, 28, 1964; V. Ye. Gul', V. V. Kovriga, E. M. Rogovaya, and N. P. Gromova, Vysokomolek. soyed., No. 10, 1868, 1964). The following methods were used in this study: 1) nuclear magnetic resonance, to determine the dynamic degree of crystallinity; 2) x-ray study of crystallinity; 3) structure study under a polarizing microscope with crossed nicols; 4) determination of the fusion index, using method ISO/tk-61 at 230C and load of 10 kg sec; 5) the "napkin" method

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UDC: 678.742.3:548.32

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ACC NR: AP6001498

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and "warping of a cylinder" method were used to determine the resistance to low temperatures. Films were prepared by extrusion with pneumatic stretching on a UP-30 machine. It was established that under such conditions a partially oriented crystalline structure is formed. By varying the stretching, inflation, and cooling rate, fine-crystalline films with good mechanical properties and high resistance to low temperatures can be produced. The authors express their gratitude to I. Ya. Slonim, Ya. M. Urman, G. M. Ishevskiy, and A. V. Yermolina for their help in this study. Orig. art. has: 3 figures and 2 tables.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 012

Card 2/2

L 06343-67 EWP(j)/EWT(m) IJP(c) RM/WW

ACC NR: AP6030325

(A.N)

SOURCE CODE: UR/0153/66/009/003/0486/0490

AUTHOR: Gul', V. Ye.; Kovriga, V. V.; Rogovaya, E. M.; Gromova, N. P.

ORG: Department of Polymer Chemistry and Technology, Moscow Technological Institute of the Meat and Dairy Industry (Kafedra khimii i tekhnologii polimerov, Moskovskiy tekhnologicheskii institut myasnoy i molochnoy promyshlennosti)

TITLE: Study of the effect of supermolecular structures of isotactic polypropylene on its mechanical properties

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 9, no. 3, 1966, 486-490

TOPIC TAGS: polypropylene plastic, polymer structure, mechanical property

ABSTRACT: The authors continue their study of the relationship between the crystal structure and mechanical properties of polypropylene by considering the relationship between the strength characteristics (breaking stress and elongation at rupture) and the size of spheroidal aggregates in films of isotactic polypropylene. The dynamic degree of crystallinity of the films was determined from NMR data, and found to remain unaffected by the formation of spherulites of various sizes. The strength characteristics decrease substantially with increasing spherulite size. In the presence of spherulites $\geq 165 \mu$ in size, brittle failure of the material takes place under the deformation conditions employed. Failure along the spherulite boundaries and in the spherulites themselves is equally probable. The causes of change in the character of

Card 1/2

UDC: 541.6

L 06343-67

ACC NR: AP6030325

the stress-strain relationship for films with various spherulite sizes are analyzed. Authors express their thanks to I. Ya. Slonim for his assistance in the recording of NMR spectra. Orig. art. has: 6 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 02Jun64/ ORIG REF: 004

Card

2/2 mlf

D'YAKONOVA, V.P.; GUL', V.Ye., prof., red.

[Technology of polymeric materials; methodological text-
book for practical work] Tekhnologiya polimernykh mate-
rialov. Pod red. V.E.Gulia. Moskva, Mosk. tekhnolog.
in-t miasnoi i molochnoi promyshl., 1964. 114 p.
(MIRA 18:12)

Card 1/2

ABSTRACT: A study has been made of the effect of radiation on the adhesion of certain elastomers or polyethylene to such substrates as cellophane, polycaprolactam films or glass. The specimens were prepared and irradiated with fast electrons with integral doses of up to 10^6 rad. It was shown that the adhesion attains a maximum at a given dose and

TOPIC TAGS: adhesion, elastomer, polyethylene, cellophane, polycaprolactam, glass, irradiation, finishing

SOURCE: Simpozium po radiatsionnoy khimii polimerov. Moscow, 1964. Radiatsionnaya khimiya polimerov (Radiation chemistry of polymers); doklady simpoziuma. Moscow, Izd-vo Nauka, 1966, 337-340

TITLE: Effect of radiation on the adhesion of certain polymers

ORG: Institute of Chemical Physics, AN SSSR (Institut khimicheskoy fiziki AN SSSR); Moscow Technological Institute of the Heat and Dairy Industry (Moskovskiy tekhnologicheskiy institut myasnoy i molochnoy promyshlennosti); Moscow Institute of Fine Chemical Technology Im. M. V. Lomonosov (Moskovskiy institut tonkoy khimicheskoy tekhnologii)

AUTHOR: Voyevskiy, S. S.; Gol'danskii, V. I.; Gul', V. Ye.; Gustov, V. V.; Yegorov, Ye. V.; Rayevskiy, V. G.

ACC NR: AT6034058

L 07336-67 EWT(m)/EWP(v)/EWP(j) IJP(c) WW/GG/GD/RM

SOURCE CODE: UR/0000/66/000/000/0337/0340

54
52
B+1

Card 2/2

vmb

SUB CODE: 07, 11 / SUBM DATE: 25Jul66 / ORIG REF: 006 / OTH REF: 002
ATD PRESS: 5101

then drops with a further increase of the dose. The increase of the adhesion was attributed to the radiation-induced acceleration of the diffusion of macromolecular segments in the contact zone. The drop of the adhesion with a further increase of the dose was explained either as cross-linking in the elastomers (butadiene-styrene and nitrile rubbers) which causes shrinkage stresses, or as degradation (butyl rubber). High adhesion was attained by irradiation of specimens prepared with cellophane or glass finished with vinyltrichlorosilane. In the case of cellophane, adhesion increased with dose up to $\sim 10^7$ rad (maximum radiation withstood by the substrate) to attain ~ 275 g/cm. Adhesion of polyethylene to glass was increased to about 400 g/cm by combining vinyltrichlorosilane/finishing of the substrate with irradiation with doses up to 5×10^7 rad. The high adhesion of systems subjected to this combined treatment was attributed, in addition to the acceleration of diffusion phenomena, to chemical bonding between the adhesive and the modified substrate. Orig. art. has: 4 figures.

ACC NR: AT6034058

E. 07336-67

ACC NR: AP7007298

SOURCE CODE: UR/0020/67/172/003/0637/0640

AUTHOR: Gul', V. Ye.; Dvoretzkaya, N. M.; Popova, G. G.; Rayevskiy, V. G.

ORG: Moscow Technological Institute of the Meat and Dairy Industry (Moskovskiy tekhnologicheskii institut myasnoy i molochnoy promyshlennosti)

TITLE: Strengthening effect in composite materials

SOURCE: AN SSSR. Doklady, v. 172, no. 3, 1967, 637-640

TOPIC TAGS: cellulose plastic, polyethylene, saran, rupture strength, adhesive bonding

ABSTRACT: The paper is devoted to a study of the influence of temperature on the physicomachanical properties of two-layer film materials under tension. The systems consisted of two identical substrate films (high-pressure polyethylene, saran, cellophane, cut out in the longitudinal and transverse direction) joined by a layer of viscoelastic binder (a 25% benzine solution of a mixture of polyisobutylenes with MW of 200,000 and 20,000 in the proportion of 1:9). The temperature variation of the cohesive strength of two-layer materials was found to obey the equation $\sigma_p = A v^n e^{u/RT}$, where σ_p is the breaking strength, A is a constant for a given type of sample, u is the "apparent" activation energy required for failure, v is the deformation rate, and n a coefficient determined by the rate of dissipation of the stresses at the point of growth of the region of failure. The experimental relation $\ln \sigma = f(1/T)$ for two-

Card 1/2

UDC: 678.5.06-416:539.4+539.612

ACC NR: AP7007298

layer and one-layer materials is characterized by the same values of the apparent activation energy of failure. It is shown that as the strength of the bond between the layers increases (with changing temperature), the strength of the two-layer material also increases. The established strengthening effect is explained by the blockage of the defects of one layer by the defect-free parts of the other, and the dissipation of stress concentration at sufficiently large values of the bonding strength between the layers. The paper was presented by Academician Kargin, V. A., 9Apr66. Orig. art. has: 4 figures, 1 table and 1 formula.

SUB CODE: 11/ SUBM DATE: 28Mar66/ ORIG REF: 003

Card

2/2

ACC NR: AP6017974

SOURCE CODE: UR/0413/66/000/010/0079/0079

INVENTORS: Gul', V. Ye.; Zakharchenko, P. I.; Belyatskaya, O. N.; Gorbatova, K. A.; Gorbachev, Yu. G.

ORG: none

TITLE: A method for obtaining a film-making material. Class 39, No. 181806

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 10, 1966, 79

TOPIC TAGS: hydrochloric acid, rubber, isoprene, polymer, sorbic acid

ABSTRACT: This Author Certificate presents a method for obtaining a film-making material by hydrochlorination of 1,4-cis-isoprene rubber. A modifier is introduced in the course of film making. To impart the preserving properties to the film and to increase its resistance to aging, sorbic acid is used as the modifier.

SUB CODE: 11/07/ SUBM DATE: 02Jan63

Card 1/1

UDC: 678.474.3.046.9:62-416

GUL', V., prof.

New polymeric materials for the meat industry. Mias.ind.SSSR
35 no.1:9-10 '64. (MIRA 17:4)

1. Moskovskiy tekhnologicheskij institut myasnoy i molochnoy
promyshlennosti.

ACCESSION NR: AP4030382

S/0063/64/009/002/0236/0238

AUTHOR: Rayevskiy, V. G.; Gul', V.G.; Zamy*slov, V. B.; Voyut'skiy, S. S.

TITLE: Diffusion phenomena in polymer mixtures

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal. v. 9, no. 2, 1964, 236-238

TOPIC TAGS: polymer, diffusion, polyethylene polybutadiene mixture, microscopic analysis, mechanical property, filler, dispersiveness, incompatible polymer, polymer homogenization

ABSTRACT: The role of diffusion phenomena in mixed polymers was investigated and confirmed. Microscopic examination of films made of mixtures of low-pressure polyethylene and SKB-30 polybutadiene (15:85 parts by weight) revealed a gradual homogenization of the polyethylene filler particles with the polybutadiene, wherein the originally easily visible discrete particles appeared to dissolve in the matrix to form a fine granular structure which did not change toward the end of the 80-day test period. Mechanical properties of mixtures of polyethylene

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1/2

ACCESSION NR: AP4030382

polybutadiene (30:70) were examined. The tensile strength increased to a maximum in 18-35 days, then decreased and leveled off after 80 days. This increase is explained by increased adhesion of the elastomer to the polyethylene filler; and the decrease, by the increased dispersion of the filler which reduces its strengthening properties. Elongation increased with increased homogenization of the system. Thus, in mixed systems the diffusion process leads to partial homogenization. In mixtures of incompatible polymers, diffusion would have the opposite effect, promoting separation and transition from a microheterogeneous to a macroheterogeneous system. Orig. art. has: 2 figures.

ASSOCIATION: Moskovskiy tekhnologicheskii institut myasnoy i molochnoy promy* shlenosti (Moscow Technological Institute for the Meat and Milk Industry)

SUBMITTED: 26Oct63

ATD PRESS: 3051

ENCL: 00

SUB CODE: 00

NO REF SOV: 008

OTHER: 001

Card

2/2

Gul', V. Ye.

Cond Chem Sci

Dissertation: "Influence of Swelling on the Mechanical Properties of Vulcanized Rubber."

13 June 49

Moscow Inst of Fine Chemical Technology Imeni M. V. Lomonosov.

KUVSHINSKIY, Ye.V.; BESSONOV, M.I.; ZAKHAROV, S.K.; SIDOROVICH, A.V.;
GUBENKO, A.B.; PANFEROV, K.V.; GUL', V.Ye.; LOMAKIN, V.A.;
TSIPES, L.Ya.; CHERNYAKINA, A.P.; SAKHNOVSKIY, Z.L.; SHCHERBAK,
P.N.; AL'SHITS, I. Ya.

Answers to the inquiry concerning the determination of the physical
and mechanical properties of plastics. Zav.lab. 26 no.1:7-28
'60. (MIRA 13:5)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR. (for Kuvshinskiy Bessonov, Zakharov, and Sidorovich). 2. TSentral'nyy nauchno-issledovatel'skiy institut stroitel'nykh konstruktsiy (for Gubenko and Panferov). 3. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni M.V.Lomonosova (for Gul').
 4. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova. Problemnaya laboratoriya fiziko-mekhanicheskikh svoystv polimerov (for Lomakin). 5. Zavod "Karbolit" (for TSipes, Chernyakina and Sakhnovskiy). 6. Gosudarstvennyy nauchno-issledovatel'skiy institut polimerizatsionnykh plastmass (for Shcherbak).
 7. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (for Al'shits)
- (Plastics--Testing)

Gal. V. E.

2312. Methods of detection of changes in natural rubber on storage. V. B. Gerasimov, I. V. Kuznetsova and R. A. Zhuravskaya. *Sovetskii Khimicheskii Revizor*, 1950, p. 116-20, 133. (VNIIO Internatsionalnoi Konferentsii, 1950). The authors, surveying on the basis of tests on vulcanizates and raw rubber solutions of rubbers stored for several years, the utility of the methods of measurement in change of turbidity of oxygen-free benzene solutions on the addition of methyl alcohol; of swelling; the increase in methyl alcohol (cf. *Rubb. Abs.*, 1950, Abs. 4784), and by the method of formation of pyrolo derivatives from rubber after chain scissions. There are 2 references and the discussion is repeated.

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The importance of intermolecular forces in the mechanism of high-elastic deformation. III. Effect of swelling on mechanical properties of vulcanized rubber. B. A. Dogadkin and V. E. Gul (Inst. Fine Chem. Technol., Moscow). *Kolloid. Zhur.* 12, 184 (1950); cf. C.A. 44, 6184h. Benzene N mixts., whose compns. could be varied at will (app. described), circulated through a wide glass tube in which a sample of rubber was suspended on a spring balance, and another sample (a ring) was placed over 2 hooks, one fixed, the other attached to a loaded trolley moving along a rail. When the wt. increased (= degree of swelling, x %) of the first sample became const., the tube was tilted, and the load extended the 2nd sample. Then the tilt, i.e. also the stress σ , was gradually reduced so as to keep the extension const. For vulcanized natural (I) and chloroprene rubber (II), the decrease of σ in time was similar at all x values and did not conform to Flory's theory (C.A. 30, 201²). The mol. wt. of segments, calcd. from this theory, increased with x . In agreement with the theory of Dogadkin, *et al.*, the relaxation time τ was a linear function of $(\sigma - \sigma_0)^2$; σ_0 is the equil. stress. The limit of τ at $\sigma - \sigma_0 = 0$ is τ_0 . When x of I increased, τ_0

decreased (e.g., from 350 sec. at $x = 0$ to 80 sec. at $x = 20\%$) because the no. of possible configurations of the chains increases with x . Between, e.g., $x = 20\%$ and 30% , τ_0 increased (e.g. to 330 sec.); it decreased again on further increase of x . These 2 stages are due (1) to straightening of the chains and (2) rupture of links between chains. Similar τ_0 - x curves were observed for I swollen in CHCl_3 ; the difference between max. and min. τ_0 and x corresponding to min. τ_0 were greater, the lower the temp. (15-30°). The τ_0 - x curve for II swollen in benzene for 1 min., and that for II in CHCl_3 regularly decreased from 1100 sec. at $x = 0$ to 100 sec. at $x = 110\%$. I swollen in CHCl_3 was extended by 150% 80 times per min., and the no. n of cycles before rupture detd. $\log n$ was 4.5 at $x = 0$, 3.7 at $x = 20\%$, and 6.5 at 110% at 24°; i.e., also showed a min. The relative deformation of I in CHCl_3 increased with x . At a given strain, the stress and the total elongation at rupture of I and II in benzene were smaller the greater x .

J. J. Bikerman

GUL', V. Ye.

USSR/Engineering - Testing, Equipment Dec 50

"Device for Studying the Mechanical Properties of High-Elastic Materials," B. A. Dogadkin, V. Ye. Gul', Moscow Inst Fine Chem Tech

"Zavod Lab" No 12, pp 1517-1519

Device permits various studies of rubber such as: plotting load-deformation diagrams, observation of changes in length under const load and after its removal, observation of stress relaxation at const deformation, detn of fatigue limit and others. Tests may be in vacuum or in some medium

USSR/Engineering - Testing, Equipment (Contd) Dec 50 182167

with simultaneous irradiation of specimens with light of given wave length. Illustrations and description of tester.

182167

GUL', V. E.

20-5-15/60

AUTHOR:

GUL', V. E., KRUTETSKAYA, G. P.

TITLE:

An Experimental Investigation of Highly Elastic Polymere Specimens as to the Relation between the Rate of their Rupture Process and the Rate of Deformation. (Eksperimental'noye issledovaniye zavisimosti skorosti vysokoslasticheskogo razryva ot skorosti deformatsii obraztsa, Russian)

PERIODICAL:

Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 5, pp 973-975 (U.S.S.R.)

ABSTRACT:

The authors here investigate the rules governing the growth of ruptures in connection with the influence exercised by various factors: The amount of damage, the velocity of deformation, the deforming stress, and the specific cohesion energy of the vulcanized substance. For this purpose samples of unfilled vulcanized substances of nitril caoutchoucs SKN-18, SKN-26 and SKN-40 with the same degree of transversal cohesion were used. The rectangular samples., which had a breadth of 50 mm, had incisions of 5, 2,3, and 1,0 mm length which were arranged so as to be transverse to the deformation axis. Also samples without incisions were used. Tests were carried out with a breaking-up machine at velocities of 100, 200, 500, and 1000 mm/min. The dependence of the velocity of growth of the rupture on the various factors was studied on the basis of slow-motion pictures.

Card 1/2

20-5-15/60

An Experimental Investigation of Highly Elastic
Polymere Specimens as to the Relation between the Rate of
their Rupture Process and the Rate of Deformation.

All experimental data were obtained at $+40^{\circ}$. Also temperature
exercises essential influence on the kinetic of the growth
of the rupture. The results obtained are illustrated in form of
diagrams.

The growth velocity of the rupture remains immeasurably low
nearly during the entire duration of the test if the deformation
method described is used, but it then increases quickly and
abruptly. In the initial stage of deformation an additional
deformation takes place in the apex of the incision, and there-
fore also an additional orientation of the material takes place.
With increasing relative length of the incision the time interval
 τ between the beginning of the deformation and the rupture
diminishes. In the case of all samples investigated τ diminishes
with increasing deformation velocity. (With 4 illustrations)

ASSOCIATION: Not given

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 2/2

CA

30

Change in the relaxation properties of vulcanized rubber on swelling. B. A. Dogadkin and V. E. Gul (Moskov. Inst. Tsvet. Khim. Tekhnol. im. M. V. Lomonosova). *Doklady Akad. Nauk S.S.S.R.* 70, 1017-19 (1950). Curves of stress relaxation with time of vulcanized natural rubber at different degrees r of swelling in CHCl_3 show an initial relatively rapid decrease, followed by a relatively slower rate; at equal times, the stress σ is the lower, the higher r . The exptl. curves deviate from the relation of Flory and Rehner (C.A. 30, 2019) $\sigma = (RT/M_e^0)[\alpha(1-\alpha)^2]$ between σ , r , the deformation α , and the equil. mol. wt. M_e^0 of the chain fragment comprised between 2 points of the space net. The calcd. M_e^0 , plotted against r (up to 34%), shows an initial increase, with a tendency to level off to a const. value; this indicates a rupture of intermol. interaction under the action of the solvent. Relaxation times τ , calcd. from the exptl. data for vulcanized natural rubber in CHCl_3 by the relation: $\tau = \tau_0 \exp[(E_a + (1/2)E_e)/RT]$, where $\sigma_0 = \sigma - \sigma_{eq}$ = nonequil. part of the stress (σ_{eq} = stress at equil.), E_e = modulus of elasticity, and $E_a = E_a(\text{initial}) - E_a(\text{equil.})$, E_a = activation energy, referred to the kinetic relaxation element V , show, at 24°, an initial fall with increasing swelling up to $Q = 0.20$ moles CHCl_3 per 100 g. inst., followed by a rise with Q , increasing to 0.30, and again a decrease with further increasing Q . A similar curve is obtained on swelling in CHCl_3 . This behavior is indicative of a nonhomogeneity of the structure of vul-

canized rubber. At higher temp. (30.5°) the curve is relatively smoother, and the min. of τ is shifted to lower Q . In contrast to natural rubber, vulcanized polychloroprene in CHCl_3 shows a uniform decrease of τ with increasing Q . The fatigue resistance of natural rubber in CHCl_3 , expressed by the log of the no. of cycles withstood before rupture, shows an initial decrease with increasing Q , with a min. at about $Q \approx 0.13$, followed by a rise with further increasing Q . The range of decreasing fatigue resistance coincides with the range of increasing τ in the same solvent. N. Thon

CA

2

The role of intermolecular forces in the mechanism of swelling of high polymers. V. K. Gul (Inst. Fine Chem. Technol., Moscow). *Kolloid. Zhur.* 13, 98-104 (1951). For the potential energy of interaction between a polymer and a solvent a general equation is derived. It contains the dipole moments, the polarizabilities, the intrinsic frequencies, and the min. intermol. distances of the polymer and the solvent. It shows why the simplified treatments based on cohesive energy, on b.p., etc., cannot be satisfactory. J. J. Bikerman

CA

50

Changes of fatigue strength of vulcanizates of natural rubber during swelling. V. I. Gul, T. V. Dorokhina, and B. A. Dogadkin (Inst. Fine Chem. Technol., Moscow). *Kolloid. Zhur.* 13, 339-45 (1951); C.I. 44, 9182.
Fatigue of rubber after extensions of equal amplitude was studied. In this paper const. load was used. An app. for extending rubber strips 200-400 times per min. is described. The rubber (I) was prepd. by vulcanizing smoked sheet 100, S 2, tetramethylthiuram disulfide 0.2, ZnO 1, stearic acid 1 part, for 10 min. at 142°; the strips were 50 x 4 x 1 mm. They were extended from 60 to 200%. The no. (n) of such extensions required for rupture was raised by moderate swelling. I, which took up 2% dibutyl phthalate (II) or 100% paraffin oil (III) had the greatest n (1.7 or 1.8 that of dry I), while I + 32% II, and I + 200% III had the n of unswollen I. Repeated extensions caused increase of the specimen length (l_0) to l . The ratio l/l_0 increased with time, at first rapidly (e.g., from 1.000 to 1.013 in 10 min. for unswollen I) and then slowly (linearly). At a given time, l/l_0 was greater for I + 11% to 20% II than for I, while I and III had smaller l/l_0 than I alone; the mixes. of I + 140 to 180% III had greater ratios than the other I + III mixes. The duration of the 1st stage of the increase of l/l_0 decreased from 40 min. for dry I to 10 min. for I + 30% II and to 5 min. for I + 180% III. The relation between elongation and actual stress (i.e., stress referred to the actual cross-section) changed irregularly with the degree of swelling (x), but the tensile strength and the total elongation were smaller the greater was x. A max. appears on the σ -x curve, because an increase in x (1) reduces the loss of energy in rupturing intermol. bonds and (2) lowers the ratio of the extnl. elongation to the total elongation; the 1st effect raises and the 2nd lowers the fatigue resistance. The max. of n is reached at lower x for II than for III because II contains polar radicals which intercept intermol. attractions.
J. I. Bickerman

GUL', V. YE.

USSR/Chemistry - Rubber
Elastomers

Nov/Dec 51

"Investigation of the Role of Intermolecular Forces in the Mechanism of Highly Elastic Deformation. V. Effect of Intermolecular Interaction on the Strength of High Polymers with Well-Expressed Spatial Structure," V. Ye. Gul', M. Ya. Sidneva, B. A. Dogadkin, Chair of Rubber Phys and Chem, Moscow Inst Fine Chem Technol
Imeni M. V. Lomonosov

"Kolloid Zhur" Vol XIII, No 6, pp 422-431

Investigated mech characteristics of vulcanizates of SKM-18, SKM-26, SKM-40 rubbers with
19878

USSR/Chemistry - Rubber
(Contd)

Nov/Dec 51

spatial structure developed to identical degree but different nitrile-group concn in chain mols. Within exptl limits presence of O_2 did not affect mech characteristics, but strength characteristics increased with increased concn of nitrile-group, i.e., with higher intensity of intermol interaction. Proposes model for describing resistance characteristics of rubber-type high polymers and eq relating resistance to temp and rate of deformation.

19878

CA

Change in the relaxation properties of vulcanized rubber
on swelling. B. A. Dogadkin and V. E. Gul (Lomonosov
Inst. Fine Chem. Technol., Moscow). *Rubber Chem. and
Technol.* 24, 140-5 (1981).—See *C.A.* 44, 6188f.
C. C. Davis

GUL', V. YE.

USSR/Chemistry - Plastics

1 Jul 52

"The Influence of Molecular Interaction on the Stability of High Polymers With Developed Spatial Structure."
V. Ye. Gul', Moscow Inst of Fine Chem Technol izani
M. V. Lomonosov

"Dok Ak Nauk SSSR" Vol LXXXV, No 1, pp 145-148

The mechanism of rupture of high polymers with developed spatial structure for ideal, noncryst, uniform materials is treated mathematically. Eqs relating the stability with viscosity, temp, and rate of longitudinal displacement of the cross section are given. Presented by Acad P. A. Rebinder 8 Apr 52.

224T21

GUL, V.E.

*Added info.
V-3, May 1953
Vulcanized
Natural Rubber*

4673. Importance of inter-molecular forces in the mechanism of high-elastic deformation. VII. Effect of the molecular interaction on fatigue strength of high polymers having a pronounced space structure. V. E. GUL, D. L. FRYUKIN, and E. A. DOGADKIN. Kolloid. Zhur., 1953, 15, 11-19; Chem. Abs., 1953, 47, 5155. Cf. this journal, 1952, abs. 2457. A vulcanisate of natural rubber containing 30% of carbon black was deformed 1040 times/min.; its temperature first rose rapidly, attributed to the heat of internal friction, and then slowly, due to a chemical process. In the absence of the latter, the final temperature would be T , and when the vulcanisate swells in paraffin oil, this decreases. Swelling weakens the intermolecular forces, and if these are weakened in another manner, T is lowered likewise. Thus, vulcanisates of synthetic rubber had a higher T , the greater the percentage of CN groups. The fatigue resistance and coefficient of mechanical loss were both lowered by strong swelling, and for strong swelling (greater than 15%), the tension strength decreases. 63401

chem
(3)

AT 64

USSR.

1937. Plastic properties of high polymers. V. I. GUL and T. I. GELLER. *Colloid J. U.S.S.R.*, 1937, 18, 81-8; *Chem. Abs.*, 1937, 48, 13200. Cf. this journal, 1963, abs. 4420. An English translation of this paper now appears.

GUL, V. E.
Rubber Abst.
Vol. 31
Nov. 1953
Crude Rubber

4426. Plastic properties of high polymers. V. E. GUL and T. I. Geller. Kolloid. Zhur., 1953, 15, 85-90; Chem. Abs., 1953, 47, 7818. An equation for the viscosity of a polymer in terms of the rate of plastic extension of a specimen at a constant true stress is given. Smoked sheet with mol. wt. 183,000 was first extended, keeping the ratio of force to the cross-section constant. Thus the increase time of the total, plastic, and high-elastic deformation was determined. The specimen was extended again, keeping constant the ratio of force to the cross-section as it would have been in the absence of high-elastic deformation. From these measurements and the equation referred to above, the viscosity was 2.5×10^9 poises.

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5-21-54

muf

BUL; V.E.

62 ✓ 1951. Results of quality evaluation of butadiene-styrene rubbers. I. V. HOPKINS, V. E. and B. A. BOWMAN. Kaim. Phys. Chem. 25: 1005-1010, 1951. Chem. Abs., Table 10, 8008. The relationship between the hardness of rubber and its long-term modulus of elasticity, E_{100} , was found to be approximately linear. An increase in E_{100} and a decrease of the creep index of crude rubber run parallel to an increase of the insoluble fraction content, to the duration of thermal plastication, and to the modulus of the vulcanized products. The tensile strength, relative elongation, fatigue strength, and aging coefficient of vulcanizates with an increase of E_{100} are reduced when the creep strength is lower. The quality of butadiene-styrene rubber can be tested by determining the long-term modulus E_{100} at 100% elongation and its creep strength.

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GHL, U.E.

608. Role of molecular forces in the mechanism of the swelling of high polymers. II. Kinetics of swelling. V. L. Gut. *Koll. Zhur.*, 1963, 18, 170-7. *Translations of Russian Technol.*, 1964, 27, 607-14. Cf. this journal, 1963, abn. 725. It is known that the rate of swelling of high-molecular compounds is a function of the chemical nature and geometrical structure of the components of the mixture. In an investigation of the molecular mechanism of swelling of high polymers having highly developed spatial structures, theoretical variations of the rate of swelling with the degree of swelling and molecular characteristics of the components of the mixture were derived for cases where the limiting rate is that of three-dimensional deformation of the specimen in the swelling process, and for the case where the slowest process is the diffusion penetration of the solvent. It is shown that, in both the above cases the rate of swelling depends essentially on the values of the specific cohesion energies of the components of the mixture. Some cohesion energies for solvents are given, and it is shown that the swelling of a smoked-sheet soft vulcanizate is greatest in the solvent whose cohesion energy is closest to that of the vulcanizate. There are 17 references.

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1958. Influence of molecular interaction on light diffusion properties of rubber solutions. V. E. GUL' and G. S. KLIVENIK. *Koll. Zhur.*, 1958, 10, 171-8. *Chem. Abs.*, 1954, 49, 11827. A method is described for determining molecular interaction and specific cohesion energy of high polymers, from the refractive index, concentration (c), and turbidity (η) of their solution. The ratio $H/c\eta$, where H is a known function of the refractive index, increases linearly with c for natural rubber in toluene, for natural rubber kept in toluene for 18 days at 70° C, and for butadiene/acrylonitrile copolymers in ethyl acetate. From the rate of increase, the molecular weight is calculated to be 370,000 for the natural rubber; 140,000 for the degraded natural rubber; and 8,100 to 390,000 for the copolymers corresponding to 0 to 36% acrylonitrile content, the rate of increase being most rapid for 28%. The turbidity of fresh and degraded natural rubber increased almost three-fold when methanol was added to the toluene solution.

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